

DOCUMENT RESUME

ED 286 611

PS 016 803

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TITLE Selected Results of a Cross-Sectional/Longitudinal Research on Sex-Role Development in German Children.
INSTITUTION Munster Univ. (West Germany). Psychologisches Inst.
SPONS AGENCY Deutsche Forschungsgemeinschaft, Bonn - Bad Godesberg (West Germany).
PUB DATE 85
NOTE 49p.; Paper based on a talk presented at the Educational Testing Service (Princeton, NJ, April 1985), and at Temple University (Philadelphia, PA, April 1985). Appended figures contain small print.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Age Differences; Children; *Cognitive Ability; Cross Sectional Studies; Foreign Countries; *Individual Development; Longitudinal Studies; Play; *Sex Role; *Sex Stereotypes
IDENTIFIERS Gender Constancy; Preference Patterns; *West Germany

ABSTRACT

Following an outline of the theoretical approach and method of a study of components of sex role development among German children, results which concern ontogenetic changes in sex role stereotypes preferences are presented. In addition, interrelations of different components of sex role development and cognitive variables are analyzed. The selected results are based on cross-sectional data from 323 boys and girls between 4 and 10.5 years of age, and on longitudinal data from 178 boys and girls of the same age range who, over 2 years, had been tested 3 times. Findings indicated that, while a general developmental pattern of sex role stereotyping could be found that was related to cognitive development, sex role preferences emerged primarily as differential variables, which were not closely related to cognitive maturity. Results further indicated that (1) sex role development in children does not simply mirror the sex role differentiation of the social environment, but rather transforms it according to cognitive abilities; (2) the relationship between cognitive development and sex role development changes with age and is complex; and (3) advanced sex role development may exhibit an increase or a decrease in sex typing depending on developmental characteristics and age. Thirteen figures, as well as references and tables, are appended. (Author/RH)

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ENTWICKLUNG UND ZUSAMMENHANGSMUSTER VON MERKMALEN DER GESCHLECHTSTYPISIERUNG IM KINDESALTER

Nr. 8

1985/2

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Das Projekt wird von der Stiftung Volkswagenwerk im
Schwerpunktprogramm Entwicklungspsychologie gefördert.

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Longitudinal Research on Sex-Role
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Hanns Martin Trautner

This paper is based on a talk given at Educational Testing Service, Princeton, New Jersey, and at Temple University, Philadelphia, Pennsylvania, April 1985.

The research was supported by a grant from the 'Stiftung Volkswagenwerk' to the author. The presentation of the research at Educational Testing Service and at Temple University was supported by a grant from the 'Deutsche Forschungsgemeinschaft'.

For their assistance in data gathering, data analysis, and preparation of handout material, I wish to thank Nicole Helbing, Dr. Arnold Lohaus, Winfried B. Sahm, and the following student assistants: Thomas Czupalla, Christel Gekeler, Rosemarie Köhler-Ruprecht, Michael Pfannenberger, Thomas Saum, Thomas Schauder, Ute Scholz, Susanne Schubert, Ute Schwalm.

I am also very grateful to the children, parents, and staff of the many kindergartens and schools that cooperated in this research.

Abstract

After giving an outline of the theoretical approach and the method of a running research on different components of sex-role development (gender constancy, sex-role stereotypes, sex-role preferences, sex-typed play behavior) in German children, some results focussing on ontogenetic changes in sex-role stereotypes and sex-role preferences are presented. Further, interrelations of different components of sex-role development and cognitive variables are analyzed. The selected results are based on cross-sectional data of 323 boys and girls aged 4;0 to 10;5 years, and on longitudinal data of 178 boys and girls of the same age range who, over two years, had been tested three times. While a general developmental pattern of sex-role stereotyping could be found that was related to cognitive development, sex-role preferences came out primarily as differential variables, not closely related to cognitive maturity. The results indicate that sex-role development in children not simply mirrors the sex-role differentiation of the social environment, but it transforms it according to the given cognitive abilities. Though, the kind of relationship between cognitive development and sex-role development is complex and changes with age. Depending upon the developmental characteristic and the age period tested, advanced sex-role development may contain an increase or a decrease of sex-typing.

INTRODUCTION

Gender is an obvious and salient human characteristic that determines many aspects of the social reality (Degenhardt & Trautner 1979; Maccoby 1966; Rosaldo & Lamphere 1974; Wesley & Wesley 1977). During childhood every child comes to know that there are two sexes¹⁾ (male and female), and he/she learns to associate physical and psychological attributes with each sex (e.g., primary and secondary sex characteristics, personality traits, occupational roles). Furthermore, every child acquires positive or negative attitudes towards the perceived or assumed sex-typed characteristics and to males and females in general. Also, the child evaluates himself/herself to the degree of 'masculinity / femininity', and it displays a more or less distinct sex-typed behavior.

If one tries to systematize what children have to learn with regard to the differentiation of human beings into males and females, four main developmental tasks can be distinguished:

- Gender constancy understanding

Acquiring knowledge that every human being is either male or female and that gender remains constant in the face of opposite-sex appearance, attitude, or behavior.

- Concepts of gender and of sex-role discrimination

Learning to associate specific physical and psychological attributes (biological features, physical appearance cues, traits, interests, behaviors) with gender.

- Sex-role attitudes and sex-role preferences

Developing an evaluative attitude towards sex-role characteristics and to males and females in general.

¹⁾ The terms gender and sex are used here interchangeably with the meaning of being biologically male or female. To denote male and female psychological attributes the terms masculinity and femininity are used. The association of psychological attributes with biological sex does not imply that sex-related differences have to be biologically caused.

- Sex-typed behavior

Being more or less sex-typed in one's own behavior.

The analysis of the research literature has shown that many of the developmental questions in the domain of gender differentiation and sex-typing ²⁾ remain unanswered: What patterns and rates of change occur in the different components of sex-role development ³⁾ in what ages, what kinds of individual differences can be observed in these changes, and in what way the different components of sex-role development are interrelated to each other and/or correlated to other developmental variables, the knowledge referring to these questions is only fragmentary (see Constantinople 1979; Huston 1983; Lloyd & Archer 1976; Maccoby 1966, 1980; Maccoby & Jacklin 1974; Merz 1979). Especially, longitudinal studies, needed to learn something about typical and differential intraindividual patterns of change, as well as about the stability of individual differences, are lacking.

If one aims primarily to trace the course of sex-role development, and not to explain individual differences, of all existent theoretical approaches, a cognitive-developmental approach (e.g., Bem 1981; Kohlberg 1966) seems to be most promising. The central notion of such an approach is that through the processing of information collected in interaction with the social environment, the developing child, according to the given cognitive abilities, constructs, or better: reconstructs, a mental representation of its social environment.

With regard to sex-role development, this reconstruction contains primarily the acquisition of gender constancy understanding, and of concepts of sex-role discrimination (sex-role stereotypes). At the same time, it is assumed that the perceived sex-related differentiation of the social world motivates the individual to adopt to the culturally prevalent sex-role standards. Acquisition of knowledge about sex-related characteristics should follow the

2) Sex-typing is used here as general term for all phenomena linked to sex or gender differentiation.

3) Sex-role development in our terminology encompasses the cognitive, emotional-attitudinal, and behavioral aspects of the developmental process of sex-typing.

same rules as acquisition of knowledge about the physical environment or other domains of the social environment. According to these assumptions, there should be a positive relationship between cognitive maturity and sex-role development. Further, cognitive, affective, and behavioral aspects of sex-typing should go together.

Based on the just outlined theoretical approach, that is, distinguishing between four developmental tasks, realizing the necessity of longitudinal studies, and taking a cognitive-developmental perspective, a research project on the sex-role development in German children aged 4 to 10 was carried out from 1981 - 1984.

The aim of the research was to answer the following questions:

- What are the cues children use to designate and identify gender?
- How does the understanding of gender constancy develop?
- What are the sex-role concepts (sex-role stereotypes) children hold for children (boys and girls) and for adults (men and women)?
- To what extent are children likely to prefer sex-appropriate objects and activities?
- How much do children act out sex-stereotyped roles in their play, and are there distinctive play styles of boys and girls?
- What age changes in the assessed variables of sex-role development can be observed cross-sectionally and longitudinally?
- Do the assessed variables of sex-role development show high or low stability over time?
- In what way does the sex-role development of boys and girls differ?
- To what extent are the different aspects of sex-role development interrelated to each other and correlated to cognitive development?

For several reasons, we restricted our study to the age range of 4 to 10 years.

- The beginning of development in the sex-related variables of interest is not before about 3 - 4 years;
- under 4 years of age, the verbal abilities required by our assessment methods are lacking;
- the investigated age range warrants a sufficient homogeneity of item contents;
- the comparability with existent studies is greatest;
- in kindergartens and elementary schools, representative samples of the considered age range are easily accessible.

We started with a cross-sectional sample of 159 boys and 164 girls aged between 4;0 years and 10;5 years. Data were gathered during Winter and Spring 1982 (= T1). 12 months later and 24 months later, the same children were tested again, as far as they still belonged to the relevant age range, they and their parents consented again to participation, and they were in the reach of the participating institutions. According to these criteria, until now, 178 children (90 girls and 88 boys) could be tested longitudinally over a two-year period. The sampling of our study is shown in Table 1.

The sample of children was obtained from six kindergartens and eleven elementary schools in the area of Frankfurt (West-Germany). The participating institutions represented a wide socioeconomic range. From this population, 323 subjects (159 boys and 164 girls) were chosen at random.

Procedure

The children were tested with regard to gender constancy understanding, sex-role stereotypes, sex-role preferences, solitary play, classification abilities, and Human Figure Drawings. Each subject was individually tested by a trained experimenter of its own sex. A second experimenter of the opposite sex recorded the subject's reactions.

Collection of data was spread over 3 days within 2 weeks in the following way:

1st day

- Man-drawing/Woman-drawing
- Assessment of sex-role stereotypes (children's section)
- Gender constancy questions

2nd day

- Videorecording of children's play
- Assessment of sex-role preferences

3rd day

- Assessment of sex-role stereotypes (adult's section)
- Classification tasks

In the present paper it is not possible to refer to all issues of our research project. The following presentation focusses on the results regarding the development of sex-role stereotypes and sex-role preferences. The selected results are based on cross-sectional data of 323 boys and girls aged 4;0 to 10;5 years, and on longitudinal data of 178 boys and girls of the same age range, who, over two years, had been tested three times (see Table 1).

THE DEVELOPMENT OF SEX-ROLE STEREOTYPES

Problem

The sexes are not only differentiated in biologically founded primary and secondary sex characters, but also with regard to culturally standardized appearance features like hairstyle, clothing, wearing finery, etc. In addition, first names, everyday activities and objects, division of labor, and several personality traits are associated with gender. Therefore, it is quite understandable, that children as young as preschool age have a substantial knowledge of sex differences

and sex-role stereotypes, prevalent in their social environment (Barry & Barry 1976; Kuhn, Nash & Bruckner 1978; Reis & Wright 1982; Thompson 1975).

In contrast to the classical meaning of 'stereotype', with its connotations of an overgeneralized, or even distorted perception of groups (see McCauley, Stitt & Segal 1980), we conceptualize sex-role stereotypes as cognitive schemas (Bem 1981; Martin & Halverson 1981), or as rules (Damon 1977; Turiel 1978) that organize and structure information about the social environment, when sex is the most salient category available for classification.

Most studies about the development of sex-role stereotypes in children have focused on age differences in the number of sex-role characteristics - usually of adults - correctly identified as masculine or feminine, according to given sex-role definitions (e.g.: Masters & Wilkinson 1976; Nadelman 1974; Reis & Wright 1982; Williams, Bennett & Best 1975).

The common method of assessment is characterized by the use of a forced-choice-technique requiring the subjects to decide, whether a given trait, activity, etc., is either male or female. The subject is not offered the choice of saying both or neither. As can easily be demonstrated, this procedure inevitably leads to an overestimation of the actually perceived sex-role discrimination (Lohaus & Trautner 1985).

Also, most of the research to date, taking adult sex-roles as the endpoint of a continuous developmental process, has only examined children's trait attributions to adults (men and women) not to children (boys and girls).

In our own study, we tried to overcome this unsatisfactory state of stereotype research by utilizing a measure that assesses children's concepts of adults' and children's sex-typed characteristics in a nonforced-choice paradigm, thus yielding information not only about developmental change in sex-role knowledge (direction of trait attribution), but also in the relative amount of trait attribution to the sexes (rigidity or flexibility of sex-role stereotyping).

In accordance with some recent work about children's stereotyping of toys and occupations (Shepard & Hess 1975; Garrett, Ein & Tremaine 1977; Carter & Patterson 1982), we predicted that children with increasing age become aware that sex-role characteristics, though typical of one gender, are not exclusively linked to males or females, but that there is also differentiation within each gender and commonality of one gender with the other.

Further, we were interested, if there are differences in the stereotyping of male and female roles, and of children's and adults' roles, and in what ways boys and girls differ in their development of sex-role stereotypes.

Method

To measure sex-role stereotypes, two lists of short statements on sex-typed traits, behaviors, and interests (half of them masculine, half feminine) of children (20 items) and of adults (18 items) were used.

The items were selected on the basis of content analyses of previous measures of sex-role stereotypes, and of several pilot studies with an initial pool of 60 items.

The items finally chosen had to meet the following criteria:

- At least 65% of the Ss attributed an item to one sex group;
- The questionnaire should contain items of different intensities of sex-role stereotyping;
- The distribution of stereotyping should be comparable for masculine and feminine items;
- The extent of stereotyping of an item should vary with age;
- As far as possible the same traits should be chosen with regard to children's roles and adults' roles;
- The items should be suitable also for use in the preference measure;
- The statements should be understandable also for the youngest children;

- Children's section and adults' section should not contain more than 20 items each.

Examples of items are given in Figure 1.

Procedure

Subjects had to assign each item to one of five categories ranging from extremely masculine to extremely feminine. The five categories were represented by yellow boxes with an opening on top and groups of blue female and/or male human figure silhouettes on front (see Figure 1). The boxes were placed on a table before the child. Childlike silhouettes were used in the children's section, larger adultlike silhouettes in the adults' section.

Following a detailed explanation of the boxes' function the items were succesively read aloud by the experimenter and the child was instructed to answer to each statement by dropping a card into the box which would fit best. Answers were scored on a five-point scale as described in Figure 1.

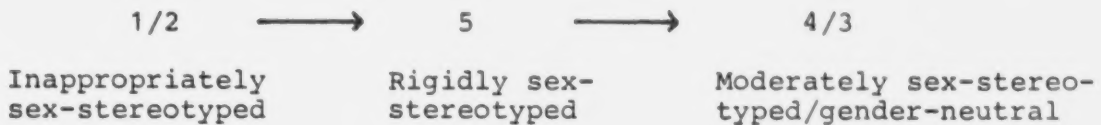
Results

The cross-sectional age differences in the distribution of answers to the 38 items of our stereotype measure, seperated for boys and girls, are shown in Figure 2. The results indicate that the increase in sex-role knowledge, manifested mainly in a growing number of extremely sex-stereotyped items, is only an early developmental step, which later is followed by a decrease in rigid stereotyping. At the same time, the typical associations are maintained. That means, as predicted, sex-role stereotypes become more flexible with age.

One can also notice that the finding of a linear increase in sex-role stereotyping during middle childhood, often reported in previous studies, is determined by the employment of the forced-choice-technique. It reflects only the linear decrease of inappropriately sex-typed attributions, found by us too.

Similar patterns as shown in Figure 2 for cross-sectional data could be found for our longitudinal data. No significant sex of subject differences obtained. On the whole, similarities of boys' and girls' answers to the sex-stereotyped items clearly outweighed the differences.

Based upon the findings summarized in Figure 2 and on detailed item analyses, the following general model of the developmental sequence of answering to stereotyped items was postulated:



A careful analysis of single items supported the assumed developmental sequence of answering to sex-stereotyped items. Over 80% of the observed patterns were consistent with our model. Of course, it is to be assumed that this general sequence varies over different items in age of occurrence and in duration.

We derived then the following formula to calculate a composite stereotype score (ST) that considers the assumed developmental sequence:

$$ST = \frac{2f (A3+A4) + f A5}{2 [2f (A1 + A2) + 38]} \cdot 100$$

The score can vary between 0 and 100. It gets higher with the growing number of moderately sex-typed and gender neutral answers compared to the number of extremely stereotyped answers, and when, at the same time, the number of inappropriately sex-typed attributions is low.

Aggregating the developmental change in sex-role stereotypes in the way of the above defined stereotype score resulted in a clear-cut linear developmental function. This applies to the cross-sectional as well as the longitudinal data, as is shown in Figure 3.

For girls, the cross-sectional and the longitudinal age differences are almost identical. For boys, the longitudinal increment at the end of elementary school years is steeper than the corresponding cross-sectional age differences, but here also the similarities of both data sources prevail.

To examine on an individual basis if the found average developmental function is composed of different patterns of change, we did a cluster analysis over the 178 subjects of our longitudinal sample (SPSS-Program Hierarchical Cluster Analysis, Hill Climbing Method). The results are shown in Figure 4. With the exception of one group (32 subjects of Cluster 2), only level differences could be observed.

Two further results seem of interest. The first relates to children's reactions to gender neutral characteristics. The second has to do with children's explanations of the perceived sex-role discrimination.

In addition to the questioning to the 38 sex-typed characteristics, we had asked the children also to assign the following eight gender neutral characteristics in the same format as used for the sex-stereotyped items: do a puzzle, driving bicycle, hide and seek, play board games, do shopping, reading, selling jewelry, serving in a restaurant.

Taking in this case the absence of rigid stereotyping as indicator of sex-role knowledge, the following age trends could be found (see Figure 5). While preschool children gave rigid answers with considerable frequencies, those answers dropped out during elementary school years. 80% of the 9 and 10 years-olds classified no single item exclusively to one sex.

To examine how children explain the sex-role discrimination perceived by them, after completion of stereotype judgements, we inquired for eight selected stereotype items (as far as they had been sex-stereotyped previously) if subjects believed that

members of the opposite sex also were 'able to', were 'allowed to', and 'wanted to' possess the characteristic in question. The findings are summarized in Table 2. The data are separated for feminine items and masculine items, because - aside from similarities - typical patterns of explanations differ for feminine and masculine items, regardless of sex of subjects.

While at all ages the missing of cross-sex characteristics was predominantly attributed to a motivational factor, and at the same time, the ability and social acceptance of cross-sex behavior were widely conceded (the discrepancy between ability and social acceptance on the one side and wanting on the other side increasing with age), there was a stronger tendency to deny ability of girls and women regarding masculine traits than to deny ability of boys and men regarding feminine traits. On the other hand, the motivation of boys and men to have feminine traits was judged lower than the aspiration for masculine traits among girls and women. In short: Females were said to be not so able to repair broken things in the house, while males were regarded not to want to clean and tidy up. This result may be taken as one more proof for the often claimed higher evaluation or attractiveness of the male role.

THE DEVELOPMENT OF SEX-ROLE PREFERENCES

Problem

To develop a preference for sex-appropriate activities, interests, and traits is regarded to be a significant developmental task by all theories of sex-role development (Kohlberg 1966; Maccoby 1980; Maccoby & Jacklin 1974). It is also considered, as an indicator of a socially desirable gender identity.

According to previous studies, predominantly with Brown's (1956) It-Scale for Children, sex-role preferences emerge during preschool age and are said to be more strongly developed

among boys than girls (Brown 1956; Croissier 1979; Kohlberg 1966; Silvern 1977).

Previous research on sex-role preferences suffers from the following conceptual and methodological deficiencies:

1. Usually, the child's choices have been scored according to adults' sex-role stereotypes, thus producing a masculine or feminine sex-role preference. As Edelbrock & Sugawara (1978) have pointed out, to use the standard of culturally prevalent sex-role stereotypes in evaluating the amount to which a child refers to sex-role definitions is dependent upon the assumption that the child is perfectly aware of the masculine and feminine stereotypes of the test stimuli. This assumption is not always valid, at least for young children, because their awareness of sex-role stereotypes is just emerging. To speak of a sex-role preference requires to refer to children's sex-role conceptions.

2. With few exceptions, sex-role preference measures have depicted only a limited range of potential role activities, most often play activities and toys (Brown 1956; Croissier 1979; De Lucia 1963). That is, in contrast to measures of sex-role stereotypes, adult roles (especially domestic and occupational activities) are not represented. In spite of this limited range of test stimuli, it is not seldom that conclusions are drawn about the development of a general sex-role preference. There are no studies that examined if it is justified to assume a general tendency to prefer characteristics of one's own sex-role, or if there exist rather content-specific sex-role preferences.

3. Children's and adults' roles are only partially sex-differentiated. To evaluate the relative importance of sex-role orientation against criteria not linked to sex, it seems necessary to offer also choices that the child might perceive as being appropriate for both sexes.

Method

With the forementioned thoughts in mind, we developed a picture choice instrument, where, similar to the SERLI of Edelbrock & Sugawara (1978), a child's preference score is based on the order in which the child chooses items stereotyped as being appropriate or inappropriate for the child's sex.

The instrument contains 24 black and white ink-drawings on cardboard pieces measuring 11 x 15 cm, organized into four sections, containing 6 items each, 2 stereotyped as feminine, 2 stereotyped as masculine, and 2 gender neutral.

To avoid the confounding of a sex-stereotyped bias and a same-sex bias of choices (an important distinction drawn by Emmerich and Shepard 1982), the drawings depict only the objects and activities in question, and yield no information relating to the sex of the person associated with them.

On the basis of pilot studies with an initial pool of 44 items, as well as on the criteria that the items are also represented in our sex-role stereotype measure, that they offer a wide range of activities and objects that are common in children's everyday experience and that children probably view as relatively desirable, the following 24 items were selected:

Item-section 'toys'

doll	(♀)
bracelets and necklaces	(♀)
puzzle	(O)
bicycle	(O)
truck	(♂)
hammer and screw-driver	(♂)

Item-section 'playing'

drawing	(♀)
hopscotch	(♀)
hide-and-seek	(O)
board games	(O)
rigging up model ships	(♂)
cowboy and indian	(♂)

<u>Item-section 'domestic works'</u>		<u>Item-section 'occupation'</u>	
cooking and baking	(♀)	cashiering in a store	(♀)
cleaning and tidying	(♀)	type-writing	(♀)
shopping	(○)	selling jewelry	(○)
reading	(○)	serving in a restaurant	(○)
repairing broken things	(♂)	bus-driving	(♂)
car-washing	(♂)	working with tools	(♂)

(♀ = 'feminine' item; ○ = 'neutral' item; ♂ = 'masculine' item)

Procedure

Each set of drawings was placed before the child on the table, and the experimenter described what each drawing depicted. Then, the subject was asked to choose the item most liked by him. The card was taken away, the next most liked item had to be chosen, and so forth.

The mean ranks of the 6 items of each section for our cross-sectional sample are shown in Figures 6.1 - 6.4.

To calculate individual preference scores per section, for each item of a section the product of the item weight (defined as mean rank difference between boys' and girls' choices, as shown in Figures 6.1 - 6.4) and of the individual ranking of the item was computed, and afterwards the six products were summed up. Positive weights were used if the item was liked better by the subject's own sex group, negative weights were used for items liked better by subjects of the opposite sex. This procedure resulted in preference scores with slightly different ranges of variation, depending upon the obtained amount of rank differences. To avoid negative scores, for each preference score a constant of 20 was added. The score resulting by random ranking would be about 20.

Results

The cross-sectional and the longitudinal results for the thus defined preference scores, separated for girls and boys, are shown in Figures 7.1 - 7.4. The results indicate that only during preschool years a considerable increase in sex-typed preferences can be observed. Later on, no systematic age changes occur.

The question if sex-role preferences are stronger among boys or girls is to be answered differently, depending upon what item section is considered. Boys exhibit significantly stronger sex-typed toy-preferences, girls exhibit significantly stronger sex-typed occupational preferences. No sex differences could be found in the sections 'playing' and 'domestic works'.

In contrast to our results regarding the development of sex-role stereotypes, at least for some age/sex-groups a considerable amount of differences between cross-sectional and longitudinal data could be observed, without suggesting a systematic kind of deviation (e.g., testing effects).

The stated lack of systematic age changes beyond preschool age can be illustrated also by the results of cluster analyses, (SPSS-Program Hierarchical Cluster Analysis, Hill Climbing Method), shown in Figures 8.1 - 8.4. A high proportion of children exhibited no change in preference scores over two years. The few children showing an increase in preference scores belonged to the group of preschool children.

In contrast to gender constancy understanding and sex-role stereotypes, sex-role preferences seem not to be primarily developmental variables but rather differential variables. At least with regard to our test stimuli, individual differences predominated over systematic intraindividual changes.

Since we have longitudinal data, we are able to determine also the stability of the measured sex-role preferences.

Table 3 shows the stability coefficients separated by item sections and by time interval. All coefficients are positive and statistically significant, but they don't reach stability in the literal sense, considered that common variance is at highest 27% (over 1 year), respectively 11% (over 2 years).

There is a more direct way to determine the individual stability of preference scores. That is, to correlate the individual ranking of preference items over time. The results of this analysis are shown in Table 4. Table 4 yields also information about age changes in stability, in that the four samples L1 to L4 differ in their age range. On the whole, stability is growing with increasing age, that is, it is highest during the age period, when no more systematic age changes appear.

INTERRELATIONS OF DIFFERENT ASPECTS OF SEX-ROLE DEVELOPMENT

As a first step in analyzing the interrelations of the different aspects of sex-role development and of the relationship between cognitive variables (classification abilities and cognitive maturity, the latter roughly measured with Human Figure Drawings) and sex-role development, we computed the cross-lagged panel correlations of the variables investigated. Comparisons of cross-lagged correlations were computed according to the method proposed by Kenny (1975).

A cognitive-developmental approach assuming fixed relations - often time-lagged - between certain levels of developmental variables, rather than probabilistic correlations between continuous variables, would rather be tested by something like a threshold model, specifying what stage of development in one variable is related to what stage of development in another variable, be it simultaneous or time-lagged. At the present, we are searching for such methods of data analysis for which also computer programs exist.

Cross-lagged panels that refer to selected results for sex-role stereotypes (Stereotype Score) and sex-role preferences

(Sum of preference scores) are presented in Figures 9 - 13. The findings may be summarized as follows.

The development of sex-role stereotypes, proceeding from rudimentary sex-role knowledge to rigid sex-stereotyping, and then to more flexible sex-role discrimination, is closely related to classificatory skills and to cognitive maturity (assessed with Human Figure Drawings). A look at Figures 10 and 11 shows that all kinds of correlations are positive and highly significant. Also, the cross-correlations are as high as the simultaneous correlations.

A totally different pattern of correlations is found for sex-role preferences (see Figures 9, 12, and 13). Here, only in the youngest age group (at the first time of measurement) the sex-role preference score is related to the other variables. This holds for the simultaneous correlations as well as for the cross-correlations. That means, early sex-role preferences are correlated with later sex-role stereotyping, classification abilities, and cognitive maturity. All other correlations are near zero.

CONCLUSION

While Maccoby (1980) had to state her conclusions with regard to the developing of sex-role stereotypes as speculations, still to be founded through empirical research, our results evidence the validity of her assumptions: "that (1) children go through a highly stereotyped, intolerant phase in their understanding of sex-roles, (2) many children become less rigid as they grow older, and (3) these changes are closely linked with other aspects of conceptual development." (p. 237)

Of course, it is not to be ruled out that the age means in stereotype scores might well be different from those obtained by us, if different items were used. Yet, this would not invalidate the found developmental sequence of first acquiring stereotype knowledge and afterwards becoming more flexible

in sex-role stereotypes. The same holds for age differences in sex-role preferences. Our finding of no increment of scores beyond preschool age does not exclude that other kinds of sex-typed interests as tested by us are acquired at a later age.

While sex-role stereotyping appears to be a developmental variable, passing through an ordered sequence of changes that are related to cognitive development, and showing a considerable amount of stability of individual differences, sex-role preferences have to be regarded primarily as differential variables, not closely related to cognitive maturity, and showing only a moderate degree of stability of individual differences.

Boys and girls are very similar in their development of sex-role stereotypes. In contrast, at least for some role sections, boys and girls differ in their extent of sex-role preference. The often claimed stronger sex-role preference among boys seems to be limited to sex-typed toy preferences.

According to the patterns of the cross-lagged correlations, exhibiting strong sex-role preferences in an early age can be interpreted as an indicator of accelerated development, later on manifested in an advanced cognitive development and in an advanced level of sex-role stereotyping. Yet, in later age, strong sex-role preferences are no more of significance for cognitive maturity or level of stereotyping, and vice versa.

An important conclusion from our results is that the rate of cognitive development determines children's sex-role development to a certain degree. Though, the kind of relationship between both is complex and changes with age. Children who are advanced cognitively tend to be also advanced in developmental variables related to sex-role learning. However, advanced sex-role development may contain an increase as well as a decrease of sex-typing, depending upon the developmental characteristic and the age period tested. Correspondently, as long as sex-role development is characterized by learning what differentiates the sexes, a marked differentiation of the sexes in the social

environment should further sex-role development. Though, the same condition will retard later sex-role development. The reverse should be true for blurring sex differences. This would impede early sex-role development, but further later development.

Our results (including some not presented here) indicate also that the advancement of cognitive abilities is a necessary but not a sufficient precondition of progress in sex-role development. Thus, e.g., flexible sex-role conceptions prevail not until the most advanced classificatory skills have been acquired. On the other hand, a substantial proportion of rigid stereotyping can still be observed after advanced classificatory are present (Trautner, Sahm & Stevermann 1983).

Once the fundamental concepts of sex-role discrimination are given and gender identity is well established, the individual kind and rate of further sex-role development seem to be largely dependent upon the extent and the evaluation of sex-role differentiation in the social environment. That is, social factors like role expectations, reinforcement, or the observation of the behavior of others, including in books, TV, etc., become more important. In any case, sex-role development in children not just mirrors the sex-role differentiation of the social environment, but it transforms it according to the given cognitive abilities.

Author's Note:

The complete results and a general discussion of the research are to be found in Trautner, Helbing & Sahm 1985.

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TABLE 1

Sampling of the Research on Sex-Typing

Age at T ₁	Time of measurement						
	T ₁		T ₂		T ₃		
	Cross-sectional (CS)		Longitudinal (L1 - L4)				
	Girls	Boys	Girls	Boys	Girls	Boys	
4;0-5;5	38	33	30	31	27	28	(L1)
5;6-6;5	26	24	21	19	20	18	(L2)
6;6-7;5	25	25	23	22	21	19	(L3)
7;6-8;5	25	25	24	23	22	23	(L4)
8;6-9;5	25	27	23	25			
9;6-10;5	25	25					
Total							
4;0-10;5	164	159	121	120	90	88	
	(N = 323)		(N = 241)		(N = 178)		

(T_1 = 1981/82; T_2 = T_1 + 12 months; T_3 = T_1 + 24 months)

TABLE 2

Affirmative Answers (%) to Three Questions Concerning Sex-Role Stereotyping, Separated for Feminine Items and Masculine Items

Feminine items			
('play with dolls', 'cry', 'clean and tidy', 'be frightened')			
Age	Boys/men are able to	Boys/men are allowed to	Boys/men want to
4;0-6;5	64	60	23
6;6-8;5	84	85	10
8;6-10;5	92	92	9

Masculine items			
('play with trucks', 'be strong', 'repair broken things', 'determine what has to be done')			
Age	Girls/women are able to	Girls/women are allowed to	Girls/women want to
4;0-6;5	50	63	38
6;6-8;5	62	78	33
8;6-10;5	76	83	34

Note.- All answers to the items in the affirmative = 100.

TABLE 3

Stability of Sex-Role Preferences in Four Item-Sections over One Year and over Two Years (N = 178)

Item section	T ₁ -T ₂	T ₂ -T ₃	T ₁ -T ₃
Toys	.34	.52	.25
Playing	.43	.51	.33
Domestic works	.41	.37	.22
Occupation	.35	.42	.21

T₂ = T₁ + 12 months; T₃ = T₁ + 24 months

TABLE 4

Stability of Individual Ranking of Preference Items in Four Item Sections ($\bar{Z}$ -Transformed Means of Rank Correlations) over One Year ($\bar{r}_{12}$; $\bar{r}_{23}$) and over Two Years ($\bar{r}_{13}$), Separated for Girls and Boys

Item section	Girls			Boys		
	$\bar{r}_{12}$	$\bar{r}_{23}$	$\bar{r}_{13}$	$\bar{r}_{12}$	$\bar{r}_{23}$	$\bar{r}_{13}$
Toys						
L1	.41	.81	.50	.64	.79	.57
L2	.68	.79	.61	.75	.80	.65
L3	.77	.78	.61	.86	.93	.86
L4	.73	.78	.54	.86	.94	.82
Playing						
L1	.30	.55	.18	.37	.35	.30
L2	.39	.41	.58	.28	.63	.55
L3	.49	.50	.47	.69	.69	.62
L4	.67	.75	.78	.62	.78	.53
Domestic works						
L1	.14	.24	.36	.02	.61	.09
L2	.71	.62	.53	.65	.43	.45
L3	.59	.76	.68	.69	.72	.53
L4	.72	.73	.79	.64	.79	.62
Occupation						
L1	.31	.53	.07	.26	.36	.30
L2	.66	.63	.73	.53	.64	.43
L3	.64	.64	.56	.55	.44	.42
L4	.63	.73	.80	.52	.49	.47

Age at T_1 : L1 = 4;0-5;5, L2 = 5;6-6;5, L3 = 6;6-7;5, L4 = 7;6-8;5

Children's section (20 items)

Sample items:

There are children who

- ... like to play with trucks
- ... are cruel and hurt other children on purpose
- ... like to play with bracelets and necklaces
- ... like to help mother with her domestic work

Who ... ?

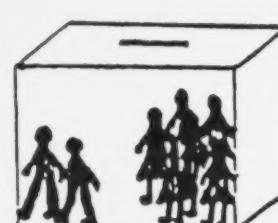
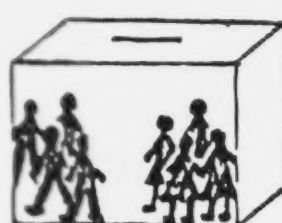
Adult's section (18 items)

Sample items:

There are adults who

- ... always want to tell others what to do
- ... often are afraid and fear a lot of things
- ... repair broken things at home
- ... cook and bake at home

Who ... ?



Each box represented a possible answer to the item

Children's section:

only boys

more boys than girls

as many boys as girls

more girls than boys

only girls

Adult's section:

only men

more men than women

as many men as women

more women than men

only women

Scoring of 'masculine' items

5

4

3

2

1

Scoring of 'feminine' items

1

2

3

4

5

Figure 1: Assessment of sex-role stereotypes

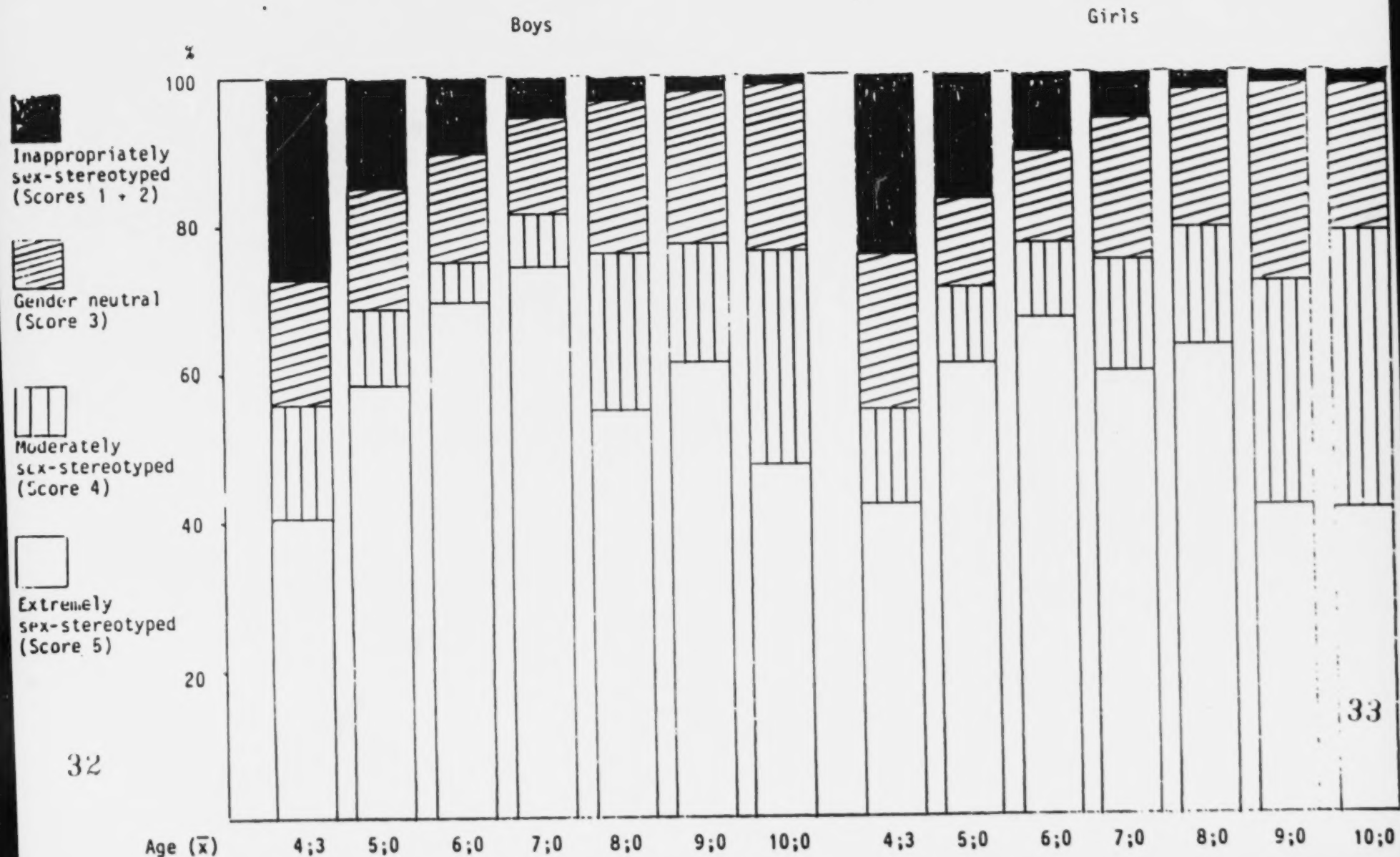


Figure 2: Proportion of answers to 38 items on children's and adult's sex-role characteristics by sex and age of child

ST-Score

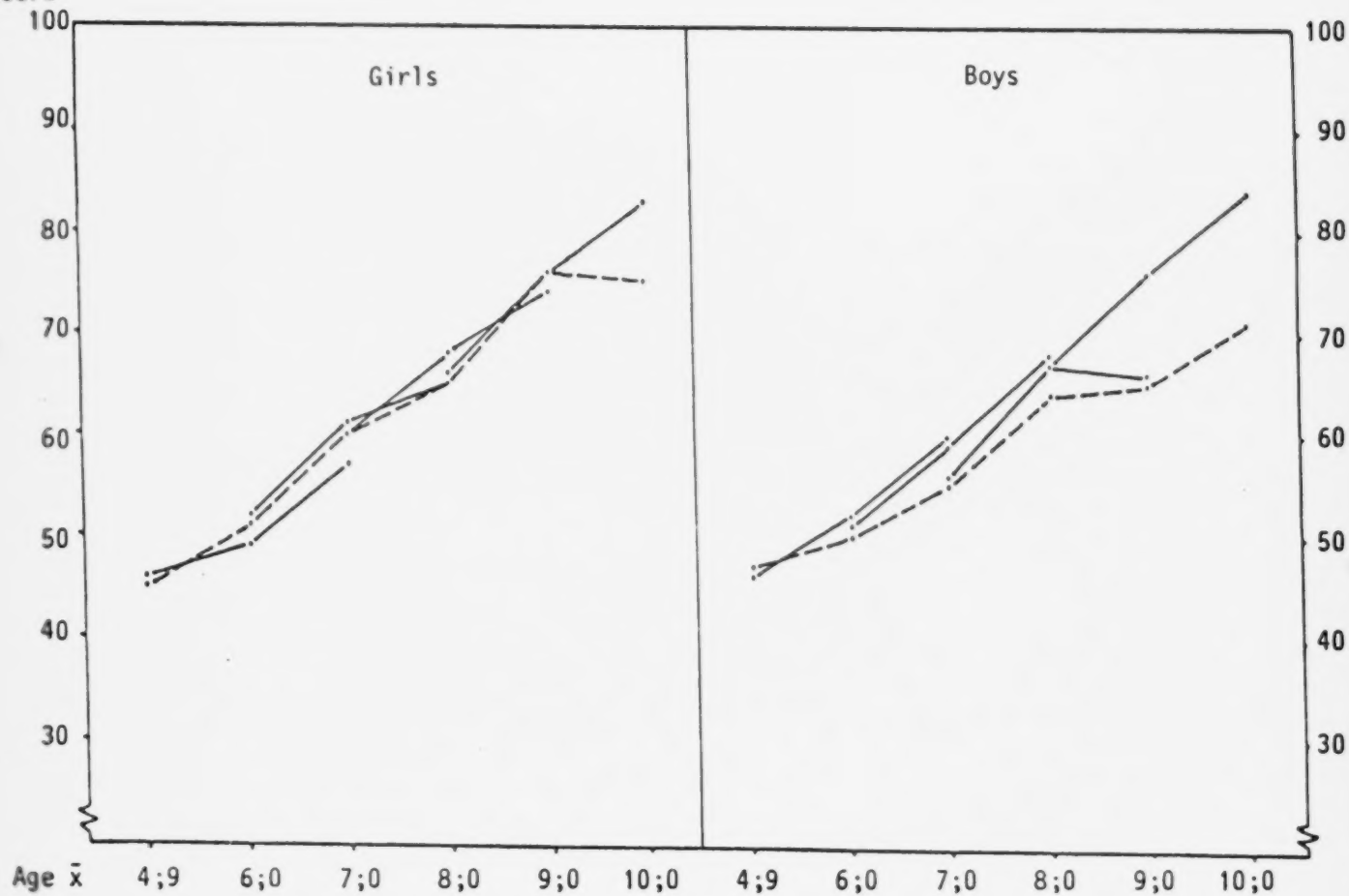


Figure 3: Developmental change of stereotype score for girls and boys
(--- cross-sectional, N = 323; — longitudinal, N = 178)

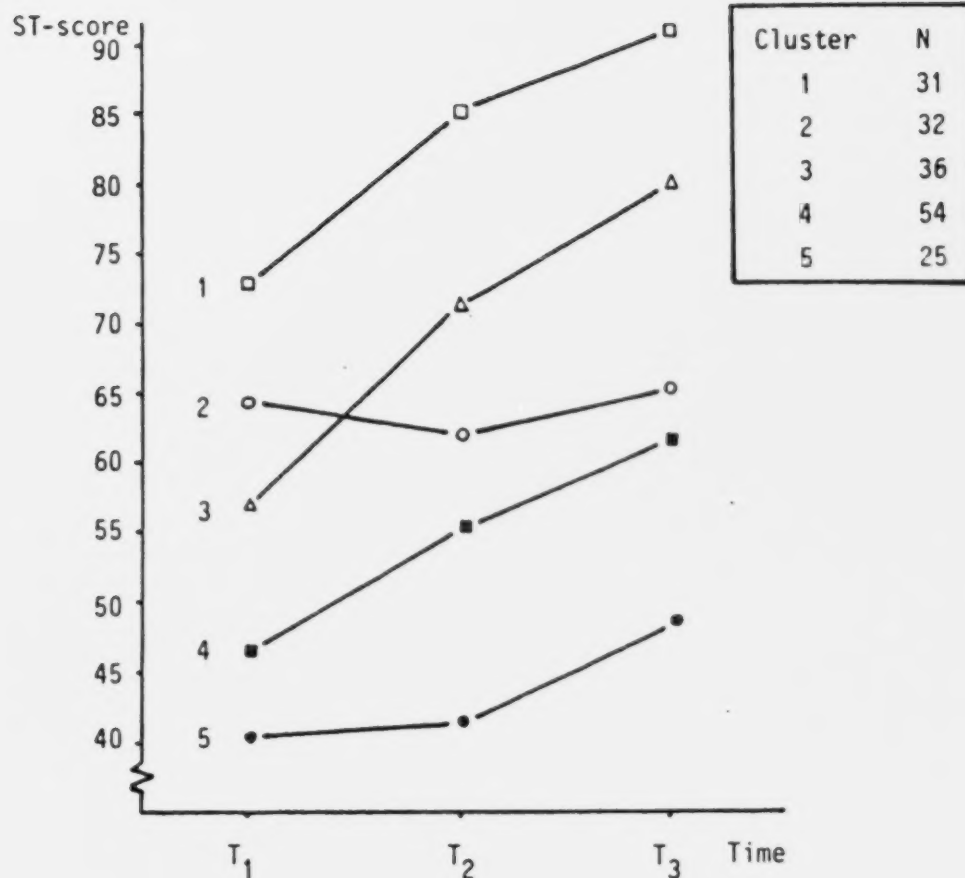


Figure 4: Types of developmental change in sex-role stereotypes
 (Cluster analysis of the longitudinal sample, N = 178)
 $T_1 = 1981/82$; $T_2 = T_1 + 12$ months; $T_3 = T_1 + 24$ months

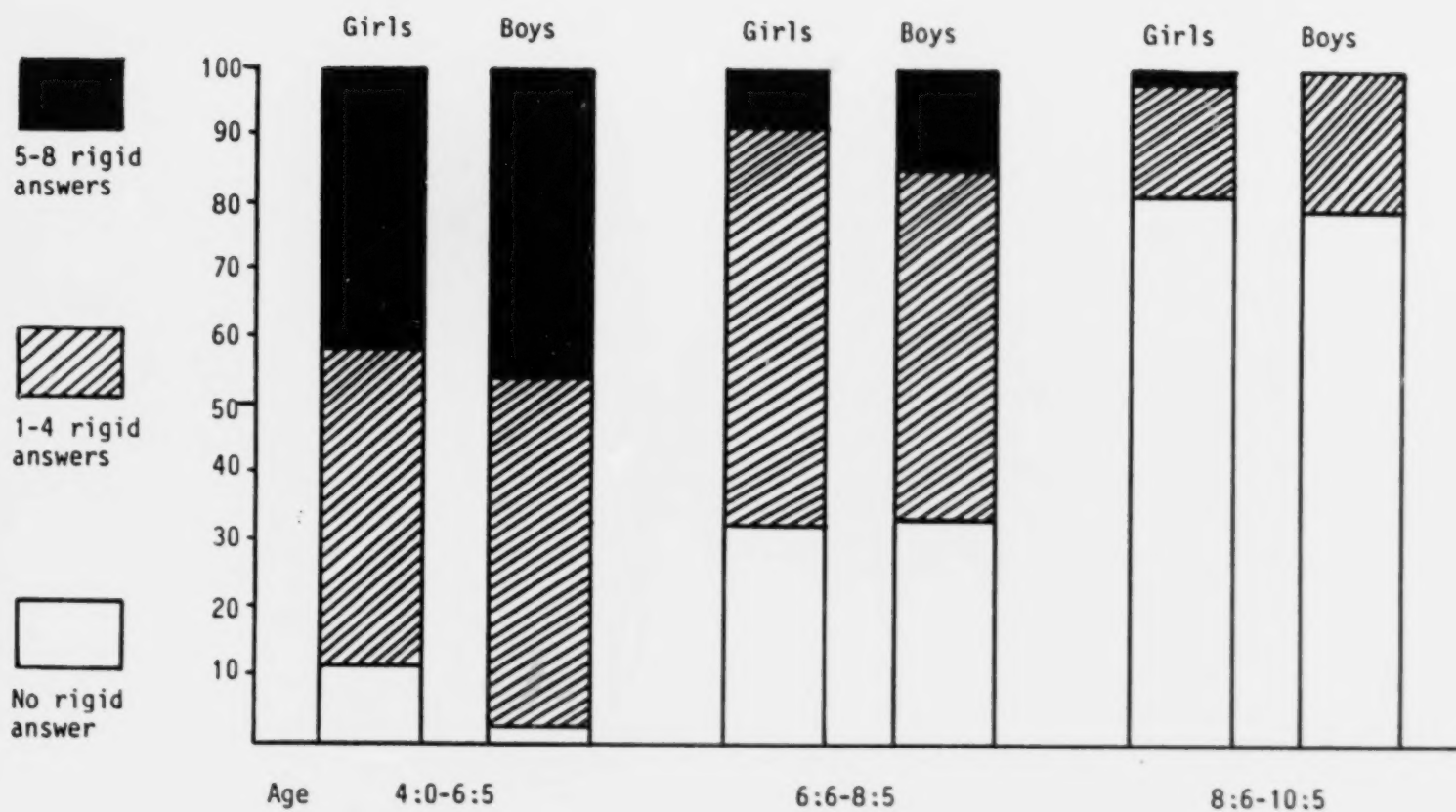


Figure 5: Frequency (in per cent) of rigid sex-stereotyped answers to 8 gender neutral items

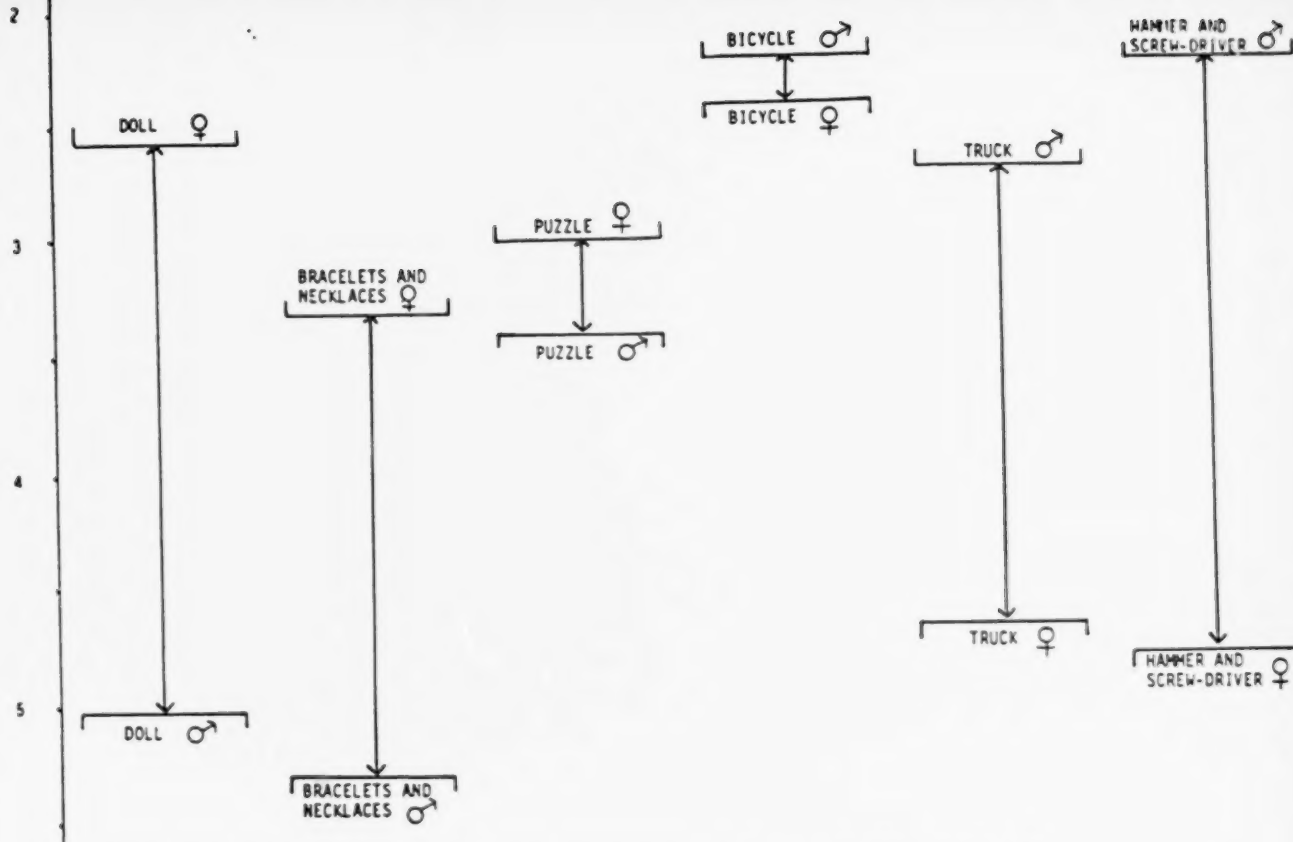


Figure 6.1: Mean ranks ($\bar{X}$) of 6 preference items (item section 'toys') for girls (♀) and boys (♂)

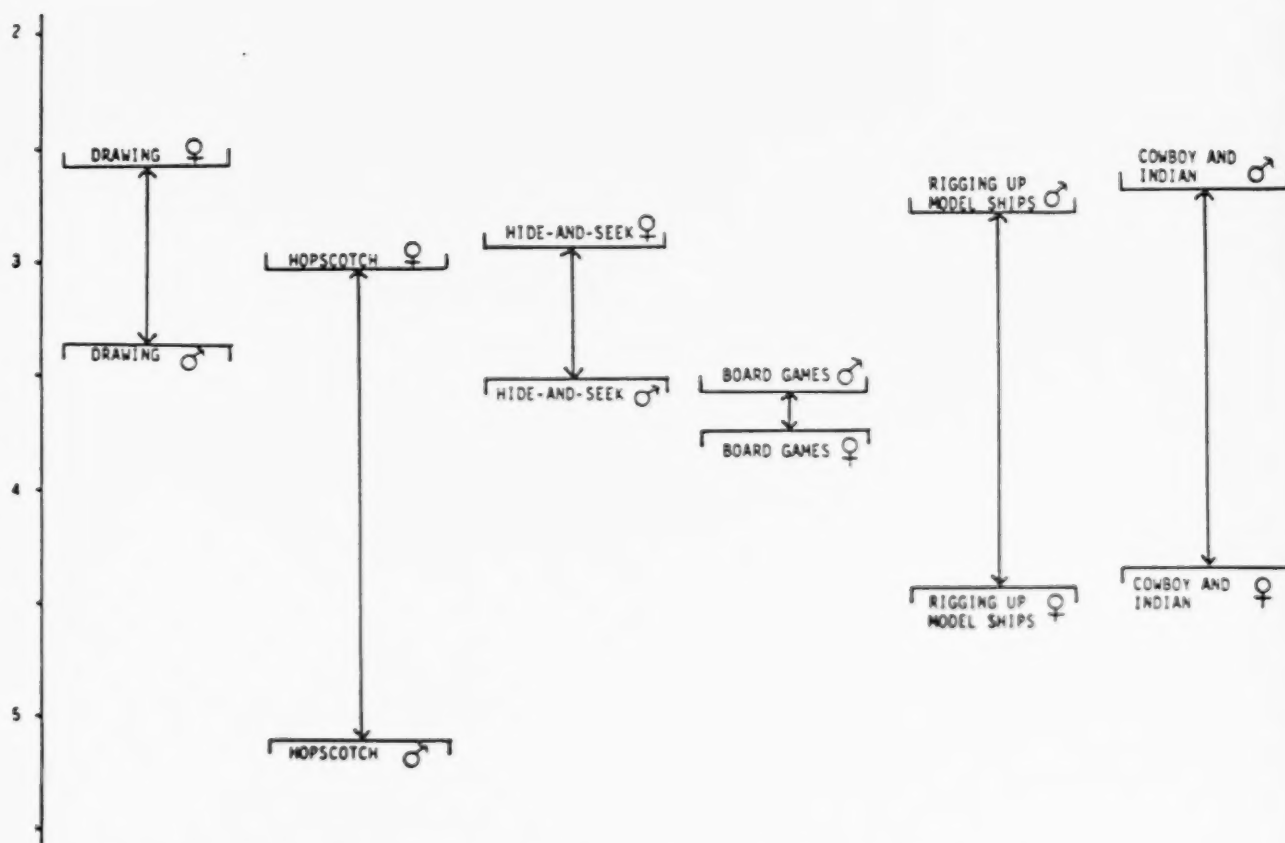


Figure 6.2: Mean ranks ($\bar{X}$) of 6 preference items (item section 'playing') for girls (♀) and boys (♂)

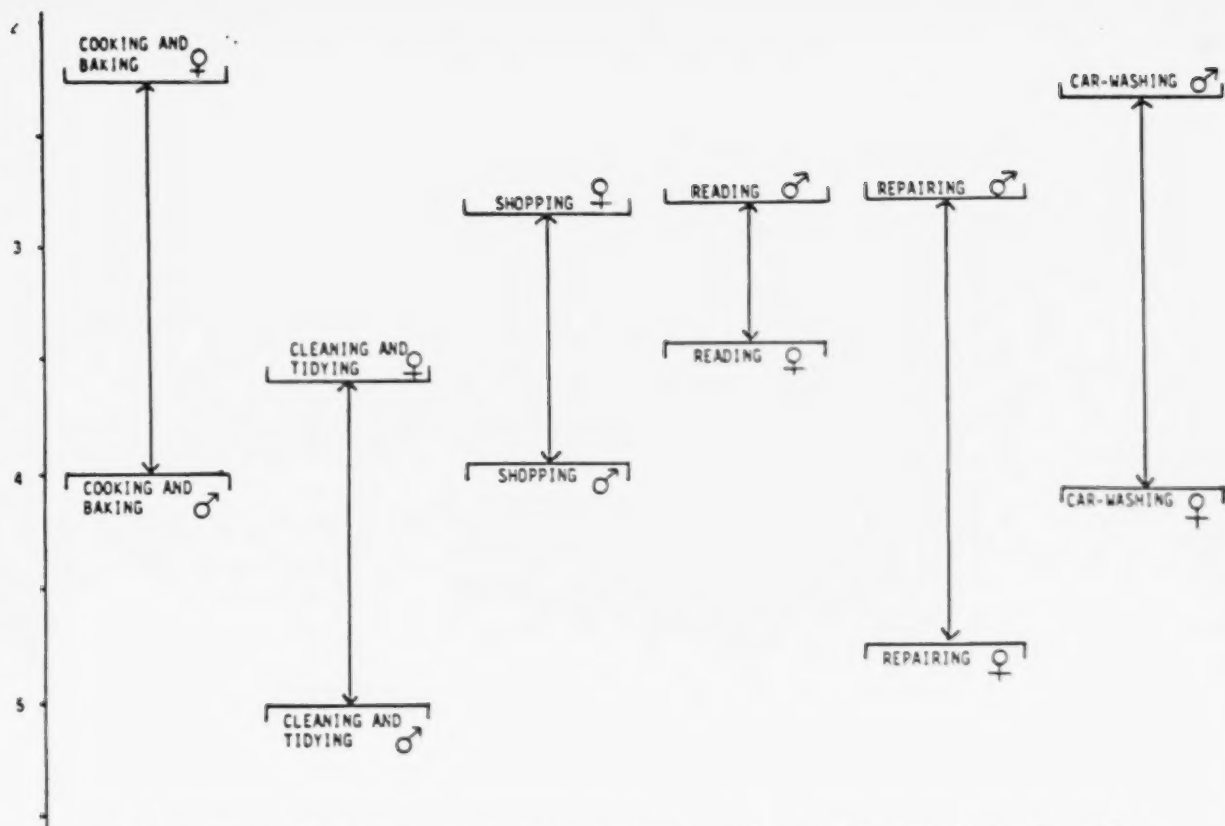


Figure 6.3: Mean ranks ($\bar{x}$) of 6 preference items (item section 'domestic works') for girls (♀) and boys (♂)

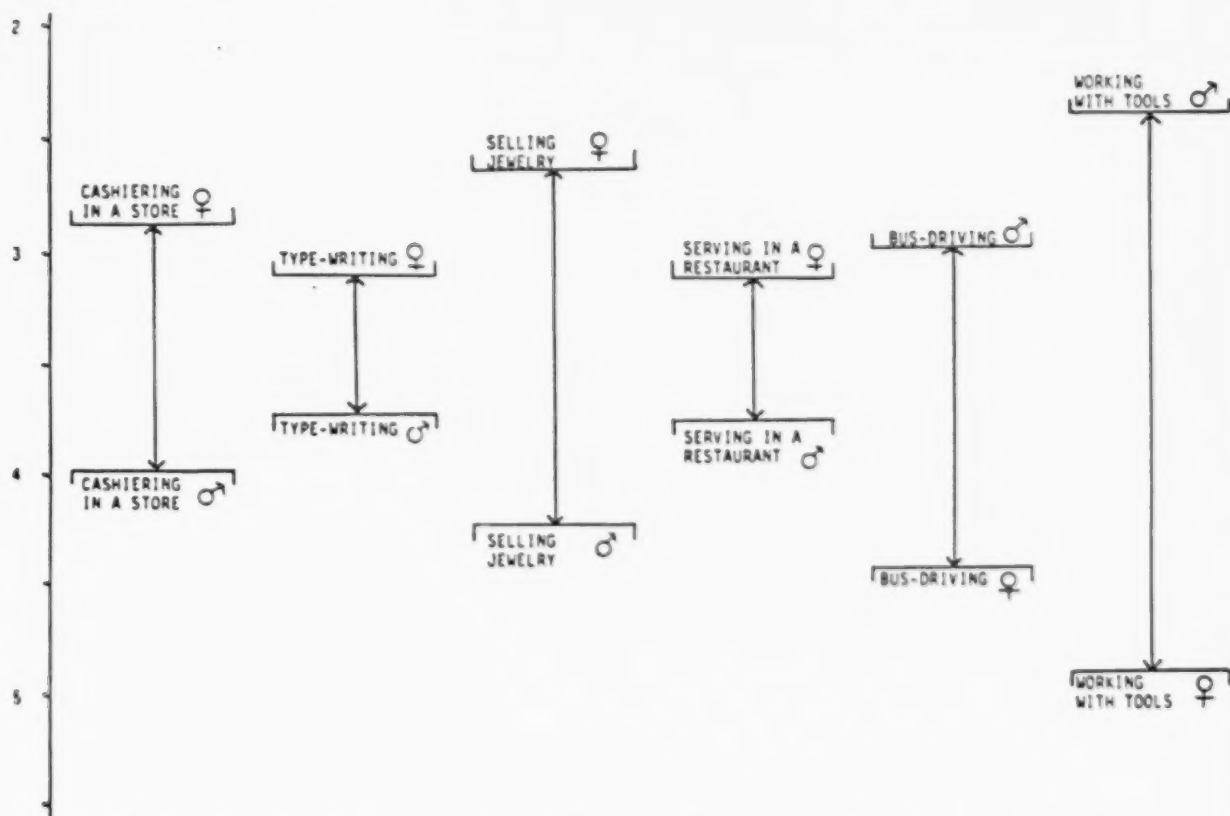


Figure 6.4: Mean ranks ($\bar{x}$) of 6 preference items (item section 'occupation') for girls (♀) and boys (♂)

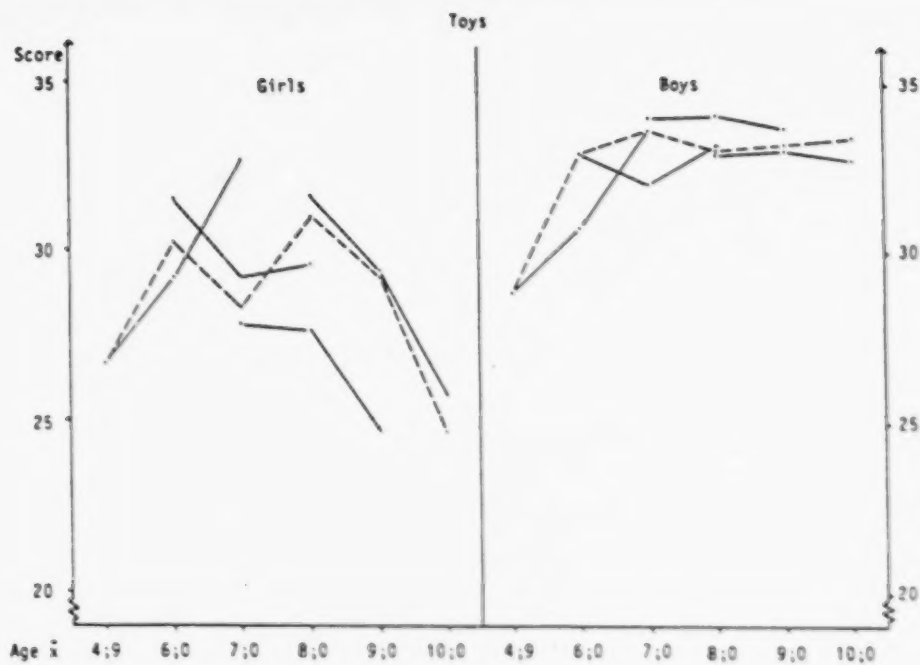


Figure 7.1: Developmental change of sex-role preferences (Item section 'toys') for girls and boys (--- cross-sectional, N = 323; — longitudinal L1 - L4, N = 178)

Note.- Choices by random order would result in a score of 20; Maximum score = 39.

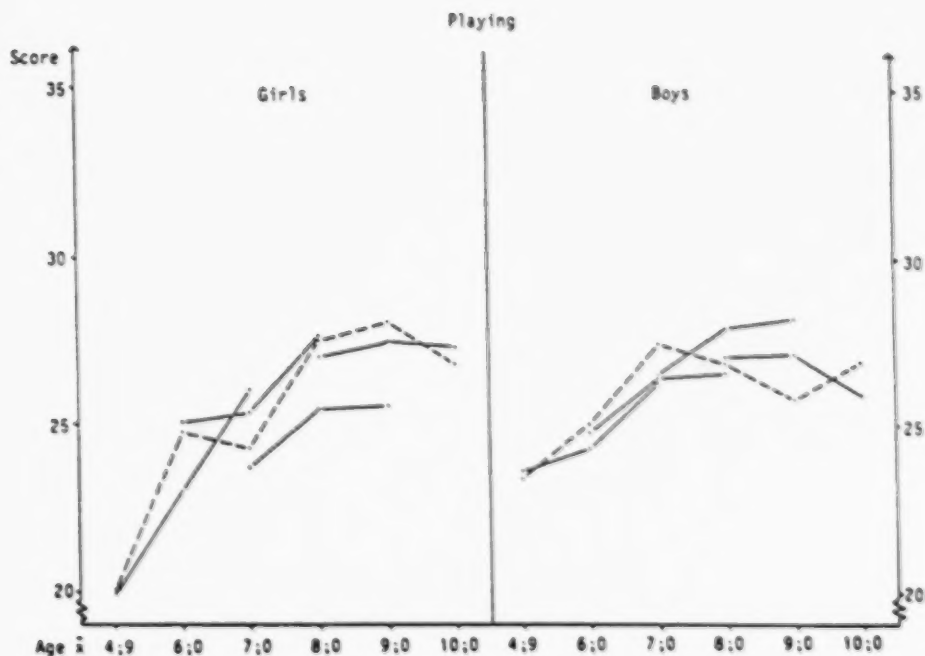


Figure 7.2: Developmental change of sex-role preferences (Item section 'playing') for girls and boys (--- cross-sectional, N = 323; — longitudinal L1 - L4, N = 178)

Note.- Choices by random order would result in a score of 20; Maximum score = 33.

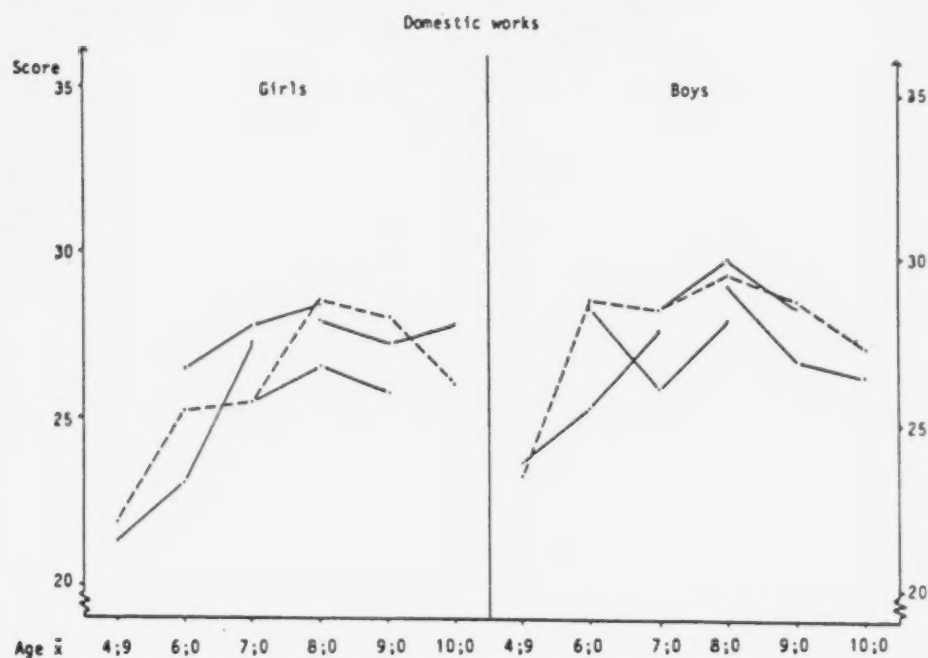


Figure 7.3: Developmental change of sex-role preferences (Item section 'domestic works') for girls and boys (--- cross-sectional, N = 323); — longitudinal L1 - L4, N = 178)

Note.- Choices by random order would result in a score of 20; Maximum score = 35.

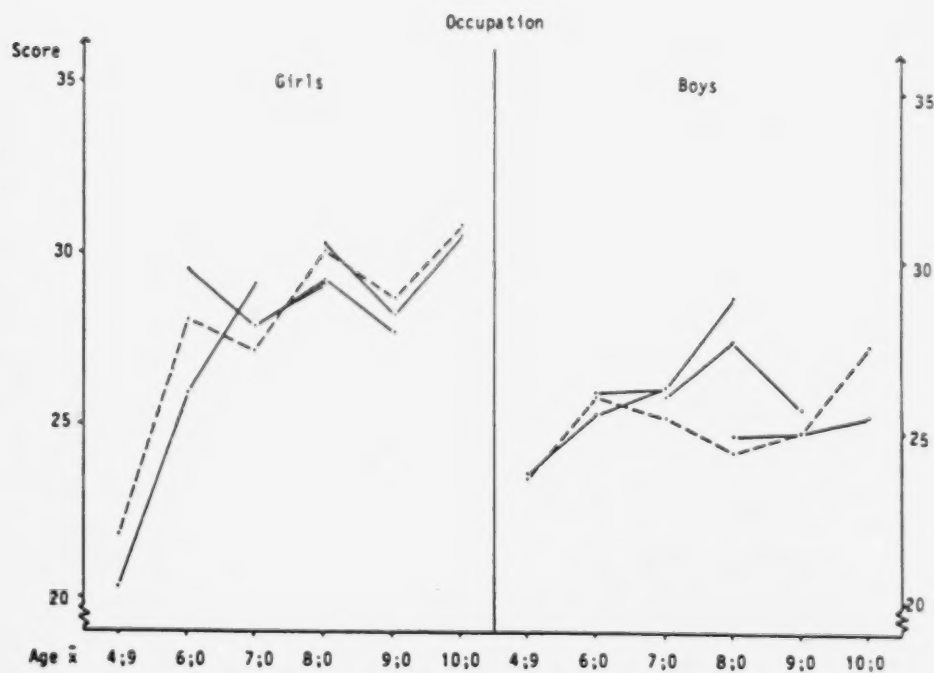


Figure 7.4: Developmental change of sex-role preferences (Item section 'occupation') for girls and boys (--- cross-sectional, N = 323); — longitudinal L1 - L4, N = 178)

Note.- Choices by random order would result in a score of 20; Maximum score = 34.

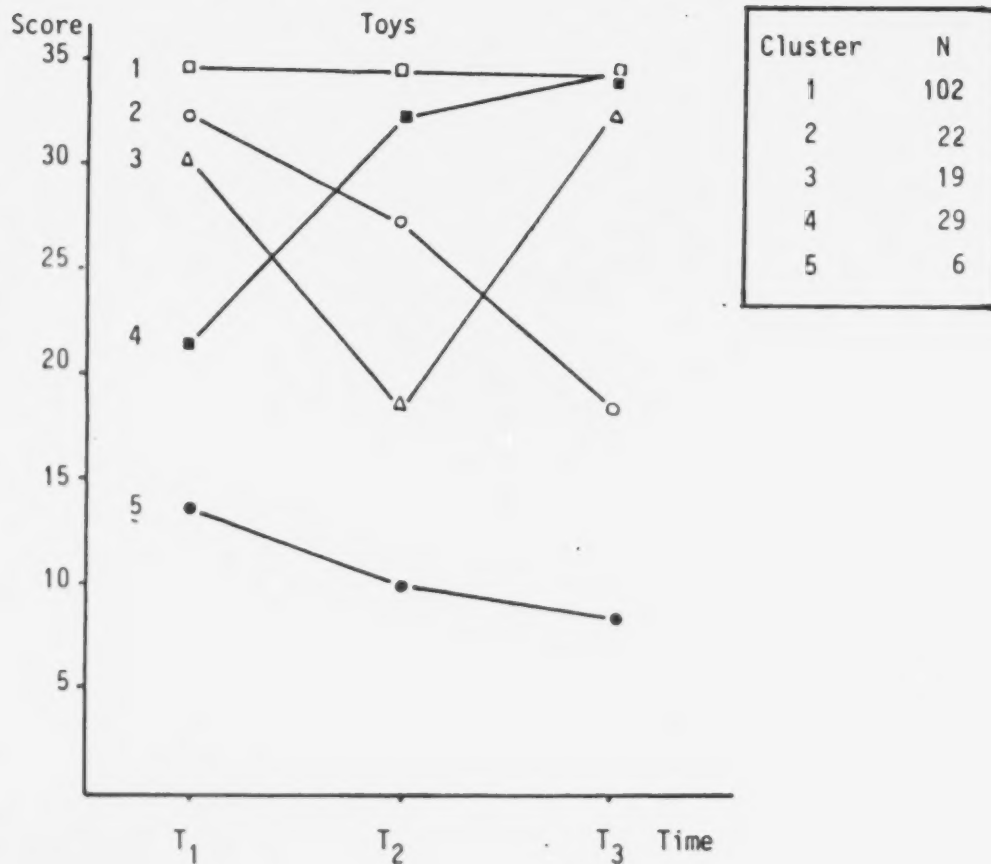


Figure 8.1: Types of developmental change in sex-role preferences: item-section 'toys'
 (Clusteranalysis of the longitudinal sample, N = 178);
 T_1 = 1981/82; T_2 = T_1 + 12 months; T_3 = T_1 + 24 months

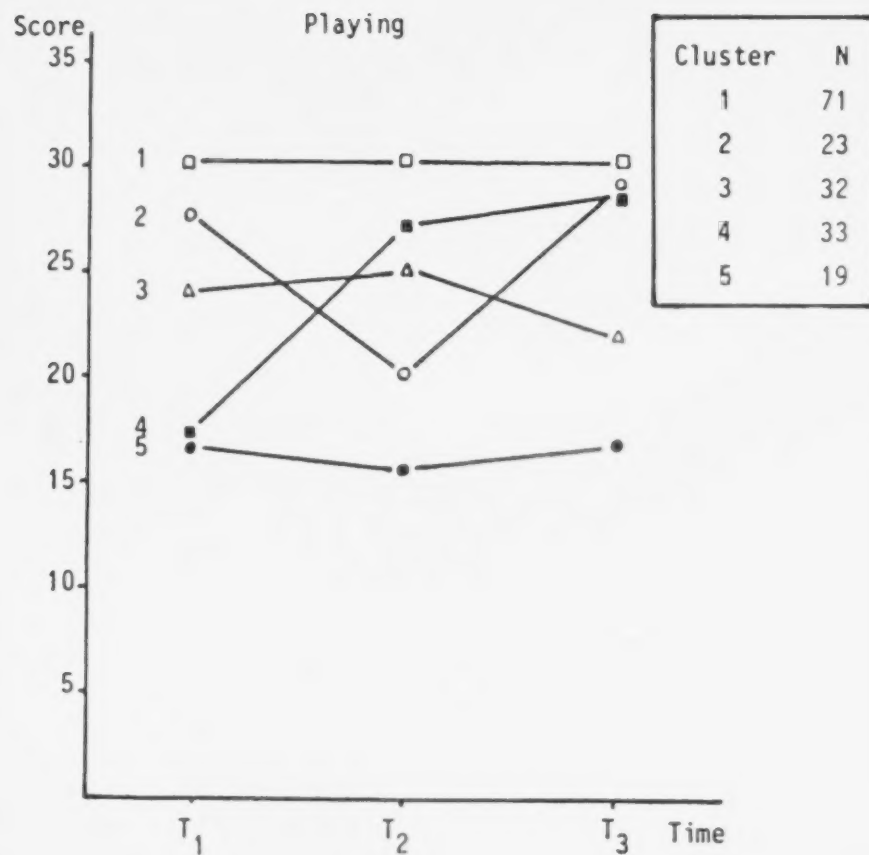


Figure 8.2: Types of developmental change in sex-role preferences: item-section 'playing'
 (Cluster analysis of the longitudinal sample, N = 178)
 $T_1 = 1981/82$; $T_2 = T_1 + 12$ months; $T_3 = T_1 + 24$ months

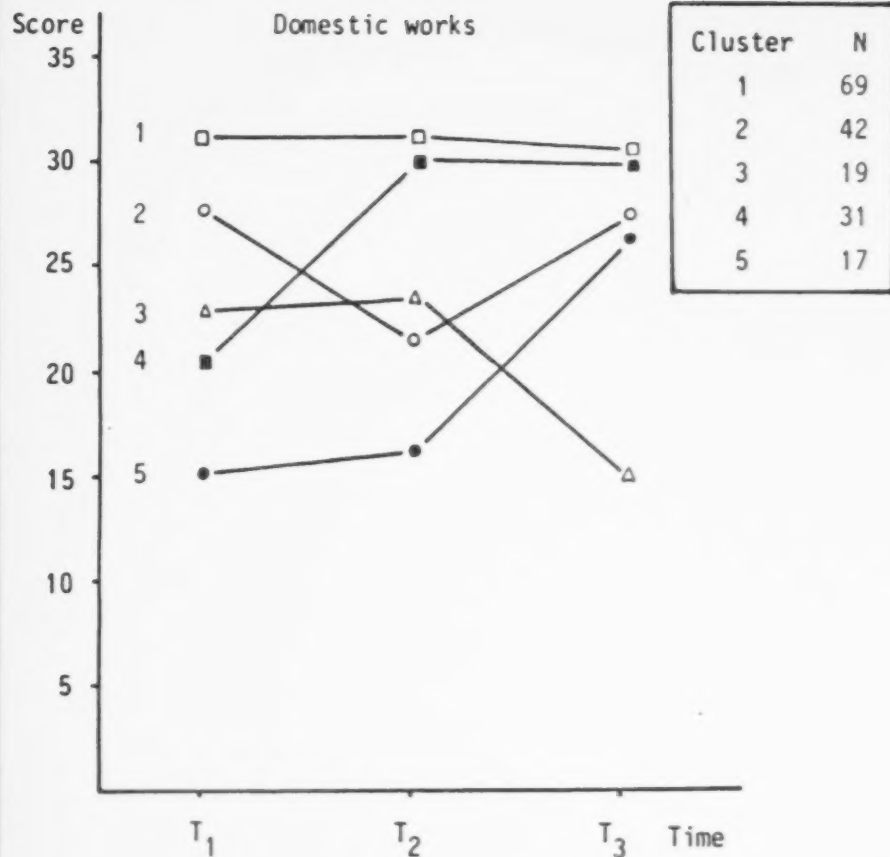


Figure 8.3: Types of developmental change in sex-role preferences: item-section 'domestic works'
 (Cluster analysis of the longitudinal sample, $N = 178$)
 $T_1 = 1981/82$; $T_2 = T_1 + 12$ months; $T_3 = T_1 + 24$ months

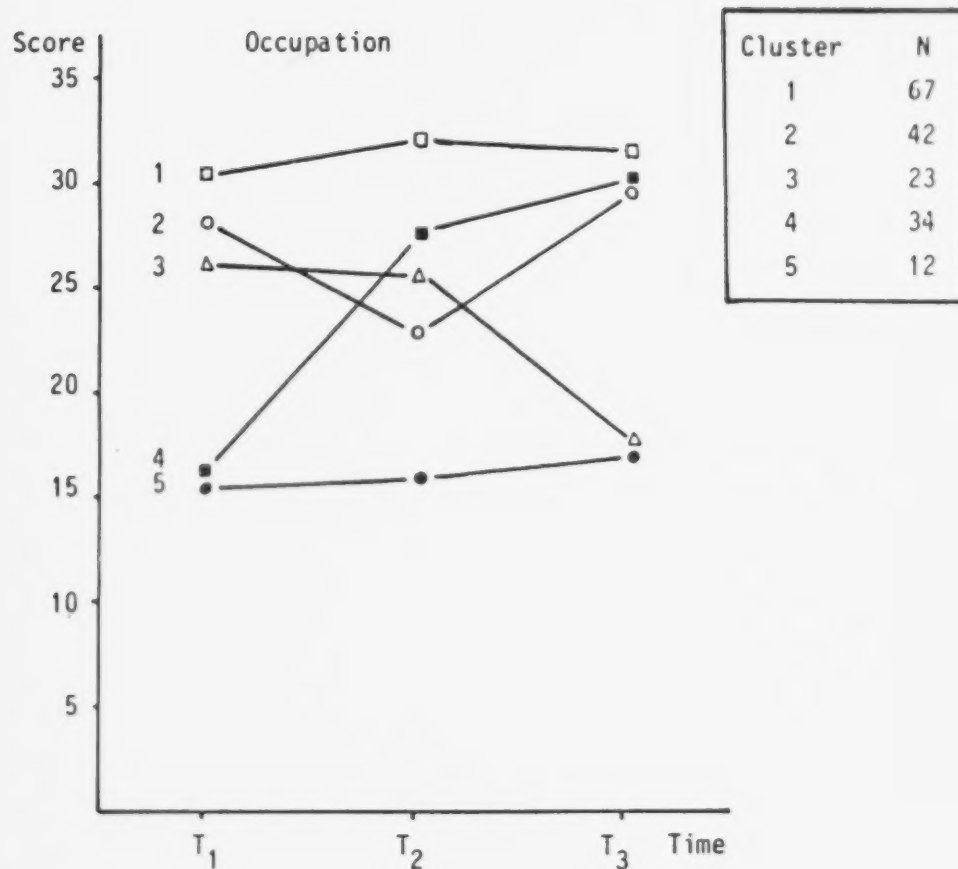


Figure 8.4: Types of developmental change in sex-role preferences: item-section 'occupation'
 (Cluster analysis of the longitudinal sample, N = 178)
 $T_1 = 1981/82$; $T_2 = 1981 + 12 \text{ months}$; $T_3 = T_1 + 24 \text{ months}$

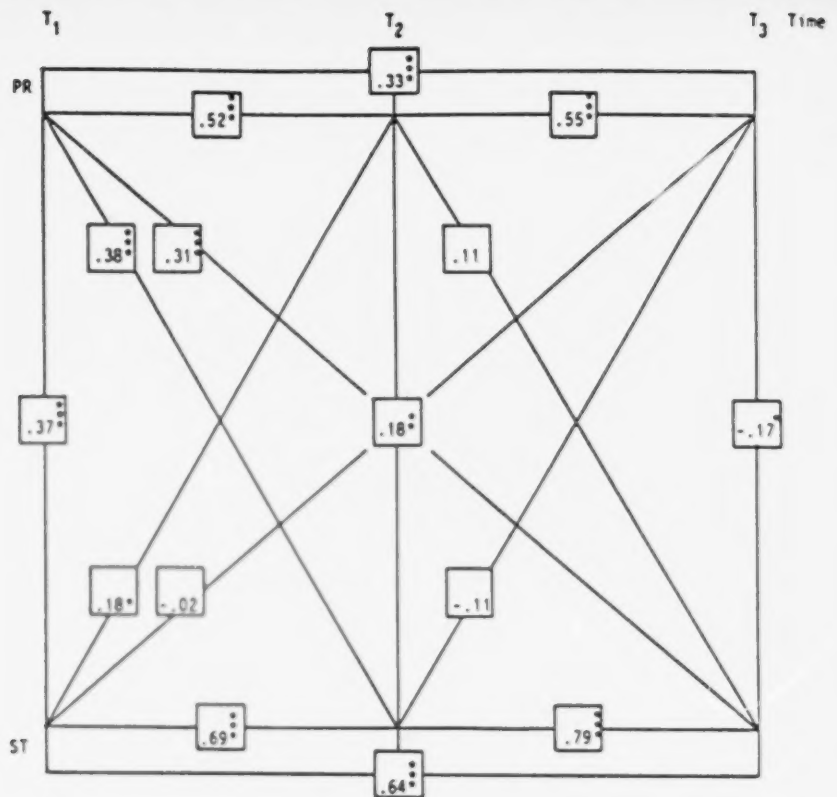


Figure 9: Cross-lagged panel:
Sex-role preferences (PR) - Sex-role stereotypes (ST)
Note.- * $p < .05$, ** $p < .01$, *** $p < .001$.
(This holds for Fig. 9 - 13)

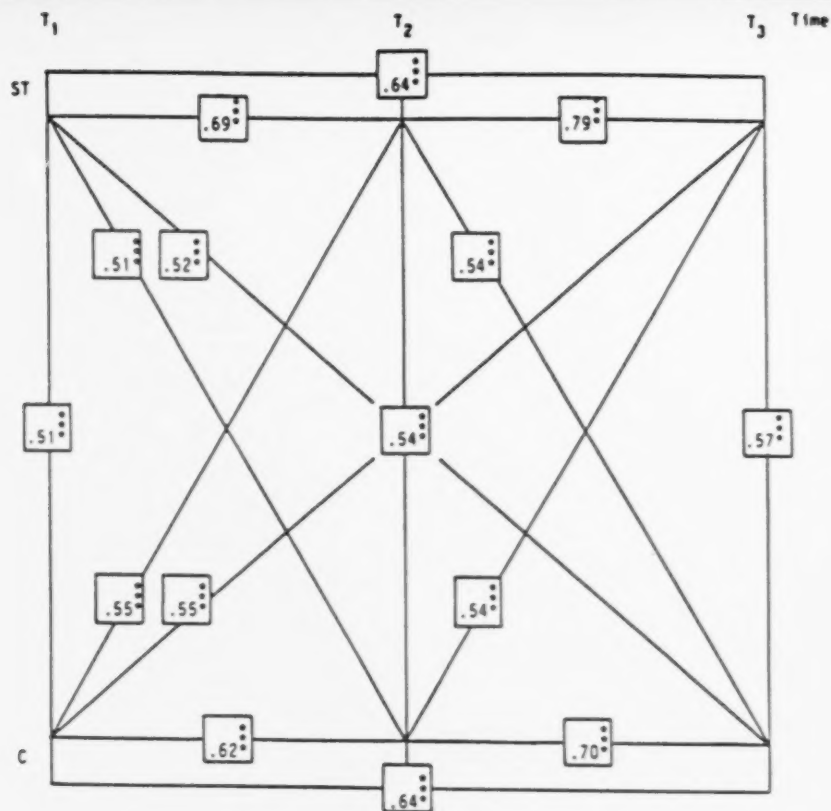


Figure 10: Cross-lagged panel:
Sex-role stereotypes (ST) - Classificatory skills (C)

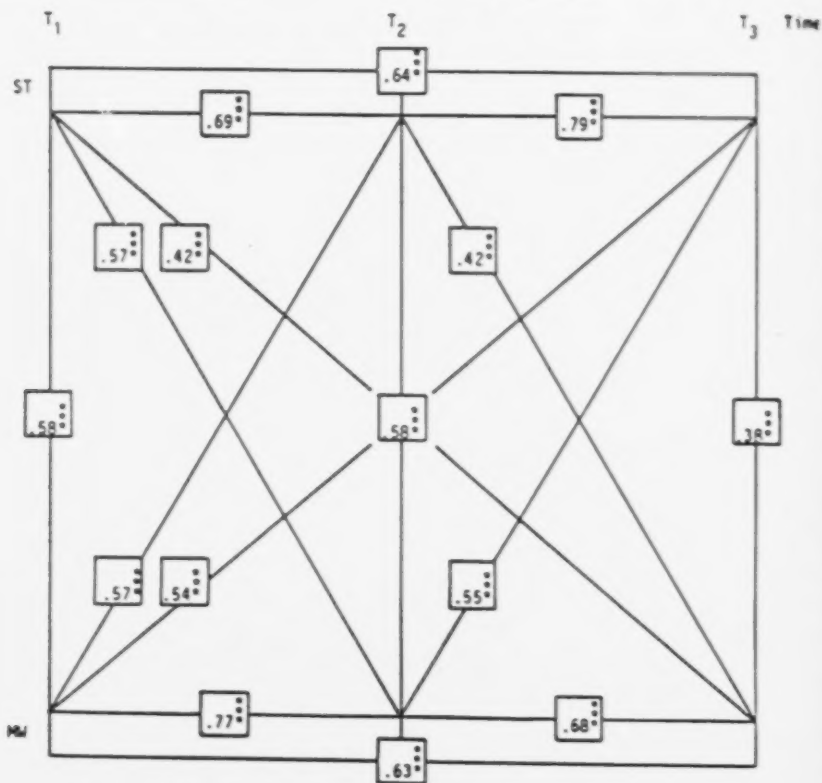


Figure 11: Cross-lagged panel:
Sex-role stereotypes (ST) - Man-/Woman-drawings (MW)

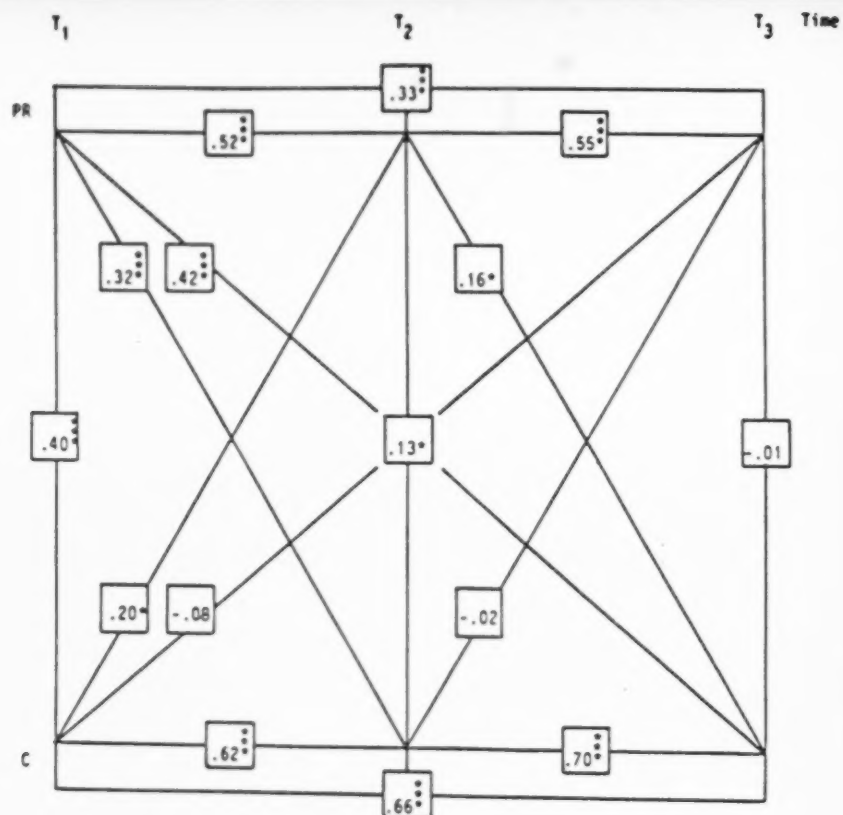


Figure 12: Cross-lagged panel:
Sex-role preferences (PR) - Classificatory skills (C)

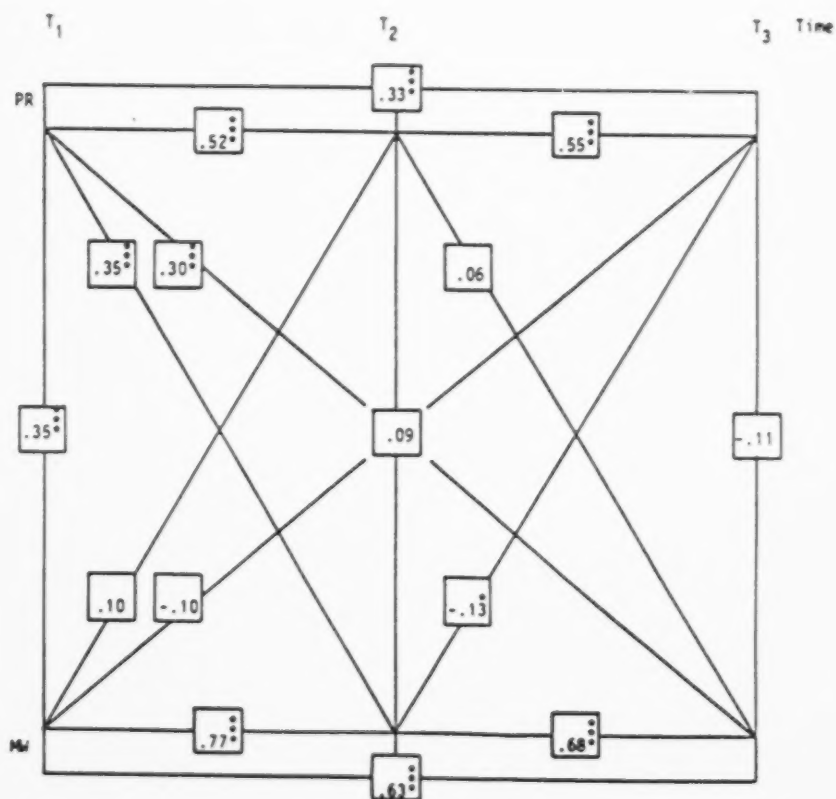


Figure 13: Cross-lagged panel:
Sex-role preferences (PR) - Man-/Woman-drawings (Mw)

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